

What is claimed is:

1. A multi-home service system, comprising:

a first interface for exchanging data with information devices connected to a home network;

a second interface for exchanging data with other information devices connected to external home networks;

a storage unit for storing a database which is established based on information collected with respect to the information devices connected to the home network and other devices connected to the external home networks; and

a control unit for collecting information on the information devices connected to the home network and said other information devices, and providing a service for mutual accesses among the information devices connected to the home network and other information devices, registering the external networks in a database based on setup information on the external home networks that is transferred through the first interface, and, if multicast packets are delivered from the information devices connected to the home network and the other devices connected to the external home networks, delivering the multicast packets through a virtual private network (VPN) tunnel to the external home networks registered in database.

2. The multi-home service system as claimed in claim 1, wherein the control unit comprises:

an application processing unit for receiving and transferring messages with a multi-home service application built therein in order for the information devices connected to the home network to be set up with accesses to and information on the external home networks;

a network processing unit for forming the VPN tunnel through communications with gateways of the external home networks, and processing mutual data exchanges with the other information devices connected to the external home networks through the VPN tunnel; and

a main processing unit for collecting information on the information devices connected to the home network and the other information devices, providing a service for mutual accesses among the information devices and the other information devices, and, if the multicast packets are transferred from the information devices connected to the home network, processing multicast packet transfers through the VPN tunnel formed through the network processing unit.

3. The multi-home service system as claimed in claim 2, wherein the application processing unit comprises:

an external home network registration unit for, if a registration request is transferred through an identifier based on registration rules provided from the multi-home service application for a registration of an external home

network, mapping the requested external home network and the identifier into the database; and

an external home network list providing unit for, if the multi-home service application requests a list of external home networks registered through the external home network registration unit, providing the list with reference to the database.

4. The multi-home service system as claimed in claim 3, wherein the application processing unit further comprises:

a second registration unit for, if the multi-home service application transfers a second registration request based on second registration rules provided to register at least one of the other information devices connected to the external home networks and drivers, mapping said at least one of the registration-requested information devices and drivers into the database; and

a second list providing unit for providing a list of said at least one of the information devices and drivers registered through the second registration unit based on the multi-home service application, with reference to the database.

5. The multi-home service system as claimed in claim 4, wherein the application processing unit further comprises a setup change unit for, if a deletion and setup change request is transferred from the multi-home service application based on edit rules provided to delete and change a setup of

options registered through the first and second registration rules, updating the database based on requested options.

6. The multi-home service system as claimed in claim 5, wherein the application processing unit further comprises a state display unit for, if a state information providing request is transferred from the multi-home service application through a state display window provided to request state information for information exchanges with the external home networks, providing the state information with reference to the database based on whether the VPN tunnel with the external home networks is formed.

7. The multi-home service system as claimed as claim 6, wherein the application processing unit further comprises a service access-allowable range setup unit for, if the multi-home service application sets up and transfers a service accessible range for the information devices connected to the home network and the other information devices based on service accessible range setup rules provided to set up a service accessible range of the external home networks with respect to each of the information devices connected to the home network, mapping transferred service accessible range setup information into the database.

8. The multi-home service system as claimed as claim 2, wherein the network processing unit comprises:

a network address translation unit for, if a message having a private IP address as an origination address is received from the information devices connected to the home network, translating the private IP address into an authenticated IP address allocated from an ISP, and translating an authentication IP address as a destination address of a message transferred from an external home network into a private IP address allocated to an information device; and

a VPN processing unit for forming the VPN tunnel through communications with gateways of the external home networks, and mapping into the database a state of whether the VPN tunnel with the external home networks is formed.

9. The multi-home service system as claimed in claim 8, wherein, if at least one of private IP addresses of the home network and one of the external home networks, wherein the home network and said one of the extended home networks constitute two home networks, exist on a same level and one of the two home networks includes the address of the other home network, the network processing unit generates a new network address table for the two home networks to use different private IP addresses in the VPN tunnel and maps the network address table into the database, and translates, based on one of a new network address table origination and destination addresses, for one of an information device connected to the home network and data packets transferred from the external home network.

10. The multi-home service system as claimed in claim 9, wherein, if the destination address is transferred in a multicast IP address format from an information device connected to the home network, the network processing unit encapsulates the multicast IP address in a data packet used on the Internet.

11. The multi-home service system as claimed in claim 10, wherein, if a gateway of the one of the external home networks transfers in the multicast format the destination IP address encapsulated in a data packet, the network processing unit multicasts the data packet to the information devices of the home network, and, if origination and destination IP addresses are transferred in a unicast format from a device packet, transfers the packet in the unicast format to the destination IP address.

12. The multi-home service system as claimed in claim 11, wherein the main processing unit comprises:

a middleware processing unit for collecting device information and service information on the information devices connected to the home network and the other devices, and mapping the device information into the database, and, when an information device connected to the home network requests access to a different information device connected to the home network and the other information devices connected to the external home networks, providing to the access-requesting information device information on the different information device and the information devices connected to the external home networks; and

a proxy processing unit for exchanging information with the information devices connected to the home network through the middleware processing unit, and exchanging information with the network processing unit to exchange data with the other information devices connected to the external home networks.

13. The multi-home service system as claimed in claim 12, wherein, when an information device connected to the home network transfers a request for an access to at least one of the other information devices connected to the one of the external home networks and no VPN tunnel with the one of the external home networks is recorded in the database, the middleware processing unit requests the network processing unit to form the VPN tunnel with the one of the external home network.

14. The multi-home service system as claimed in claim 13, wherein, if the multicast packets are transferred to the one of the external home networks through the VPN tunnel, the middleware processing unit forwards the multicast packets to the information devices connected to the home network.

15. The multi-home service system as claimed in claim 14, wherein, if a response message is transferred from an information device having received at least one of the multicast packets, the middleware processing unit

transfers the response message to an origination address of the multicast packets through the VPN tunnel.

16. The multi-home service system as claimed in claim 3, wherein, if an information device connected to the home network transfers a specific service request for an information device of a specific external home network registered for a service through the multi-home service application, the main processing unit transfers to a destination address of the corresponding information device connected to the home network, a data packet for requesting the specific service to be executed through the VPN tunnel with the specific external home network.

17. The multi-home service system as claimed in claim 16, wherein, if the VPN tunnel with the specific external home network is not formed, the main processing unit requests the network processing unit to form the VPN tunnel.

18. The multi-home service system as claimed in claim 17, wherein, if a service inaccessible message is received from the specific external home network, the main processing unit updates the database.

19. The multi-home service system as claimed in claim 18, wherein, if the service inaccessible message is received from the specified external home network, the main processing unit transfers an inaccessible message to the service-requesting information device.



20. The multi-home service system as claimed in claim 19, wherein, if a data packet requesting a service for an access to an information device connected to the home network is received through the VPN tunnel from an external home network and the external home network is accessible, the main processing unit transfers the data packet to a destination address of the packet.